e-Front runners

Display Attached Controller

@E.Terminal for MC

USER'S MANUAL

Hardware

FEH300b

Preface

This hardware edition of the user's manual describes system composition, specifications, and handling of the @E.Terminal. In order to operate the hardware properly, please read this user's manual carefully. When using modules or peripheral devices, be sure to read the corresponding user's manuals listed below.

Title	Manual No.	Contents
@E.Terminal for MC User's Manual <Function>	FEH301	Describes functions and the usage of motion control content for @E.Terminal for MC.
V8 series Hardware Specifications	2016NEx	Hardware specifications and handling procedures of the MONITOUCH V8 series are explained.
V8 series Reference Manual	1055NEx	Describes functions and the usage of the MONITOUCH V8 series.
V series Macro Reference	1056NEx	Describes overview of the macro of the V-SFT version 5, the usage of the macro editor and contents of the macro commands.
V8 series Introductory Manual	1057NEx	Describes basic operation of the MONITOUCH V8 series.
V8 series Connection Manual	2201NEx	The connection and communication parameters for the V8 series and controllers are explained in detail.
User's Manual Hardware, MICREX-SX series SPH	FEH201	Describes the system configuration, the specifications and operations of modules in the MICREX-SX series.
User's Manual Instruction (Standard Loader), MICREX-SX series	FEH588	Describes the memory, language and system definitions of the MICREX-SX series.
User's Manual SX-Programmer Standard <Reference>, MICREX-SX series	FEH590	Describes the menu and icon of the SX-Programmer Standard all of the operations of the SX-Programmer Standard.
User's Manual Instruction (D300win), MICREX-SX series	FEH200	Describes the memory, language and system definitions of the MICREX-SX series.
User's Manual D300win <Reference>, MICREX-SX series	FEH257	Describes the menu and icon of D300winV3 and all of the operations of D300winV3.
FALDIC α series User's Manual, RYS-V Type	MHT258 (Eng)	Describes the specifications and operations of FALDIC α series.
ALPHA 5 series User's Manual, RYT-V Type	MEHT300	Describes the specifications and operations of ALPHA 5 series.

In addition to the above manuals, the following Fuji Electric Systems Co., Ltd. site offers various manuals and technical documents associated with the @E.Terminal for MC.

URL http://www.fesys.co.jp/eng/

Notes

1. This manual may not be reproduced in whole or part in any form without prior written approval by the manufacturer.
2. The contents of this manual (including specifications) are subject to change without prior notice.
3. If you find any ambiguous or incorrect descriptions in this manual, please write them down (along with the manual No. shown on the cover) and contact FUJI.

Safety Precautions

Be sure to read the “Safety Precautions” thoroughly before using the module.
Here, the safety precaution items are classified into “Warning” and “Caution.”

⚠ **Warning**	: Incorrect handling of the device may result in death or serious injury.
⚠ **Caution**	: Incorrect handling of the device may result in minor injury or physical damage.

Even some items indicated by “Caution” may also result in a serious accident.

Both safety instruction categories provide important information. Be sure to strictly observe these instructions.

⚠ Warning

- ◊ Never use the output signal of @E.Terminal for operations that may threaten human life or damage the system, such as signals used in case of emergency. Please design the system so that it can cope with the malfunctions of a touch switch. A malfunction of a touch switch will result in machine accident or damage.
- ◊ Turn off the power supply when you set up the unit, connect new cables or perform maintenance or inspections. Otherwise, electrical shock or damage may occur.
- ◊ Never touch any terminals while the power is on. Otherwise, electric shock may occur.
- ◊ You must put a cover on the terminals on the unit when you turn the power on and operate the unit. Otherwise, electric shock may occur.
- ◊ The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, do not ingest the leaked liquid crystal. If the liquid crystal spills on skin or clothing, use soap and wash off thoroughly.
- ◊ Never disassemble, recharge, deform by pressure, short-circuit, reverse the polarity of the lithium battery, nor dispose of the lithium battery in fire. Failure to follow these conditions will lead to explosion or ignition.
- ◊ Never use a lithium battery that is deformed, leaks, or shows any other signs of abnormality. Failure to follow these conditions will lead to explosion or ignition.
- ◊ The power lamp flashes when the backlight is at the end of life or is faulty. However, the switches on the screen are operable at this time. Do not touch the screen when the screen becomes dark and the power lamp flashes. Otherwise, a malfunction may occur and result in machine accident or damage.

Safety Precautions

⚠ Caution

- ◊ Check the appearance of the unit when it is unpacked. Do not use the unit if any damage or deformation is found. Failure to do so may lead to fire, damage or malfunction.
- ◊ For use in a facility or for a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, please consult your local distributor.
- ◊ Operate (or store) @E.Terminal under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage or deterioration.
- ◊ Understand the following environmental limits for use and storage of @E.Terminal. Otherwise, fire or damage to the unit may result.
  - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids or cutting oil can come into contact with the unit.
  - Avoid high temperature, high humidity, and outside weather conditions, such as wind, rain or direct sunlight.
  - Avoid locations where excessive dust, salt, and metallic particles are present.
  - Avoid installing the unit in a location where vibration or physical shock may be transmitted.
- ◊ Equipment must be correctly mounted so that the main terminal of @E.Terminal will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- ◊ Check periodically that terminal screws on the power supply terminal block and fixtures are firmly tightened. Loosened screws may result in fire or malfunction.
- ◊ Tighten terminal screws on the power supply terminal block of display part equally to a torque of 0.8 N·m for the NP5M0101-5H4/4H4, NP5N0011-5H4/4H4, or 1.2 N·m for the NP5M0101-3H4/NP5N-0011-3H4. And tighten terminal screws on the power supply terminal block of the controller unit equally to a torque of 0.5 to 0.6 N·m. Improper tightening of screws may result in fire, malfunction, or trouble.
- ◊ Tighten mounting screws on the unit equally to a torque of 0.5 to 0.7 N·m. Excessive tightening may distort the panel surface. Loose tightening may cause @E.Terminal to come off, malfunction or be short-circuited.
- ◊ @E.Terminal has a glass screen. Do not drop or give physical shock to the unit. Otherwise, the screen may be damaged.
- ◊ Connect the cables correctly to the terminals of @E.Terminal in accordance with the specified voltage and wattage. Over-voltage, over-wattage, or incorrect cable connection could cause fire, malfunction or damage to the unit.
- ◊ Be sure to establish a ground of @E.Terminal. The FG terminal must be used exclusively for the unit with the level of grounding resistance less than 100Ω. Otherwise, electric shock or a fire may occur.
- ◊ Prevent any conductive particles from entering into @E.Terminal. Failure to do so may lead to fire, damage, or malfunction.
- ◊ After wiring is finished, remove the paper used as a dust cover before starting to operate @E.Terminal. Operation with the cover attached may result in accident, fire, malfunction, or trouble.
- ◊ Do not attempt to repair @E.Terminal at your site. Ask us or the designated contractor for repair.
- ◊ Do not repair, disassemble or modify @E.Terminal. We are not responsible for any damages resulting from repair, disassembly or modification of @E.Terminal that was performed by an unauthorized person.
- ◊ Do not use a sharp-pointed tool when pressing a touch switch. Doing so may damage the screen. Doing so may damage the screen.
- ◊ Only experts are authorized to set up the unit, connect the cables or perform maintenance and inspection.
- ◊ Lithium batteries contain combustible material such as lithium or organic solvent. Mishandling may cause heat, explosion or ignition resulting in fire or injury. Read related manuals carefully and handle the lithium battery correctly as instructed.
- ◊ When using @E.Terminal that has analog switch resolution with resistance film, do not press two or more points on the screen at the same time. If two or more positions are pressed at the same time, the switch located between the pressed positions activates.
- ◊ Take safety precautions during such operations as setting change during running, forced output, start, and stop. Any misoperation may cause unexpected machine motions, resulting in machine accident or damage.
- ◊ In facilities where a failure of @E.Terminal could lead to accident threatening human life or other serious damage, be sure that the facilities are equipped with adequate safeguards.
- ◊ At the time of disposal, @E.Terminal must be treated as industrial waste.
- ◊ Before touching @E.Terminal, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- ◊ The LED lamp on the CF card interface cover illuminates in red when the power is supplied to the CF card. Never remove the CF card or turn off the power of @E.Terminal while the LED lamp is lit. Doing so may destroy the data on the CF card. Check that the LED lamp has gone off before removing the CF card or turning off the power of @E.Terminal.

[General Notes]

- Never bundle control cables nor input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep these cables at least 200 mm away from the high-voltage and large-current carrying cables. Otherwise, malfunction may occur due to noise.
- When using @E.Terminal in an environment where a source of high-frequency noise is present, it is recommended that the FG shielded cable (communication cable) be grounded at its ends. However, the cable may be grounded only at one end if this is necessary due to unstable communication conditions or for any other reason.
- Plug connectors or sockets of @E.Terminal in the correct orientation. Failure to do so may lead to damage or malfunction.
- If a LAN cable is inserted into the MJ1 or MJ2 connector on @E.Terminal, the counterpart device may be damaged. Check the indication on the unit and insert a cable into the correct position.
- Do not use thinners for cleaning because they may discolor @E.Terminal surface. Use alcohol or benzine commercially available.
- If a data receive error occurs when @E.Terminal and the counterpart (PLC, temperature controller, etc.) are started at the same time, read the manual for the counterpart unit and remove the error correctly.
- Avoid discharging static electricity on the mounting panel of @E.Terminal. Static charges can damage the unit and cause malfunctions. Otherwise, malfunction may occur due to noise.
- Avoid prolonged display of any fixed pattern. Due to the characteristics of the liquid crystal display, an afterimage may occur. If a prolonged display of a fixed pattern is expected, use the auto OFF function of the backlight.

[Notes on LCD]

Note that the following conditions may occur under normal circumstances.

- The response time, brightness and colors of @E.Terminal may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the liquid crystal characteristics.
- There are variations in brightness and colors on each unit.
- Cold cathode tubes are incorporated into the LCD display for backlights. Optical properties (brightness, irregular colors, etc.) may change in a low-temperature environment or over time of operation.

Revisions

*Manual No. is shown on the cover.

Printed on	*Manual No.	Revision contents
Aug. 2008	FEH300	First edition
Nov. 2008	FEH300a	• Display part is changed from UG40 series to V8 series. • Accessory "Noise filter" is eliminated from controller hardware version "03" or later.
Dec. 2008	FEH300b	@E.Terminal (No contents installed) was added.

Contents

Section 1 General

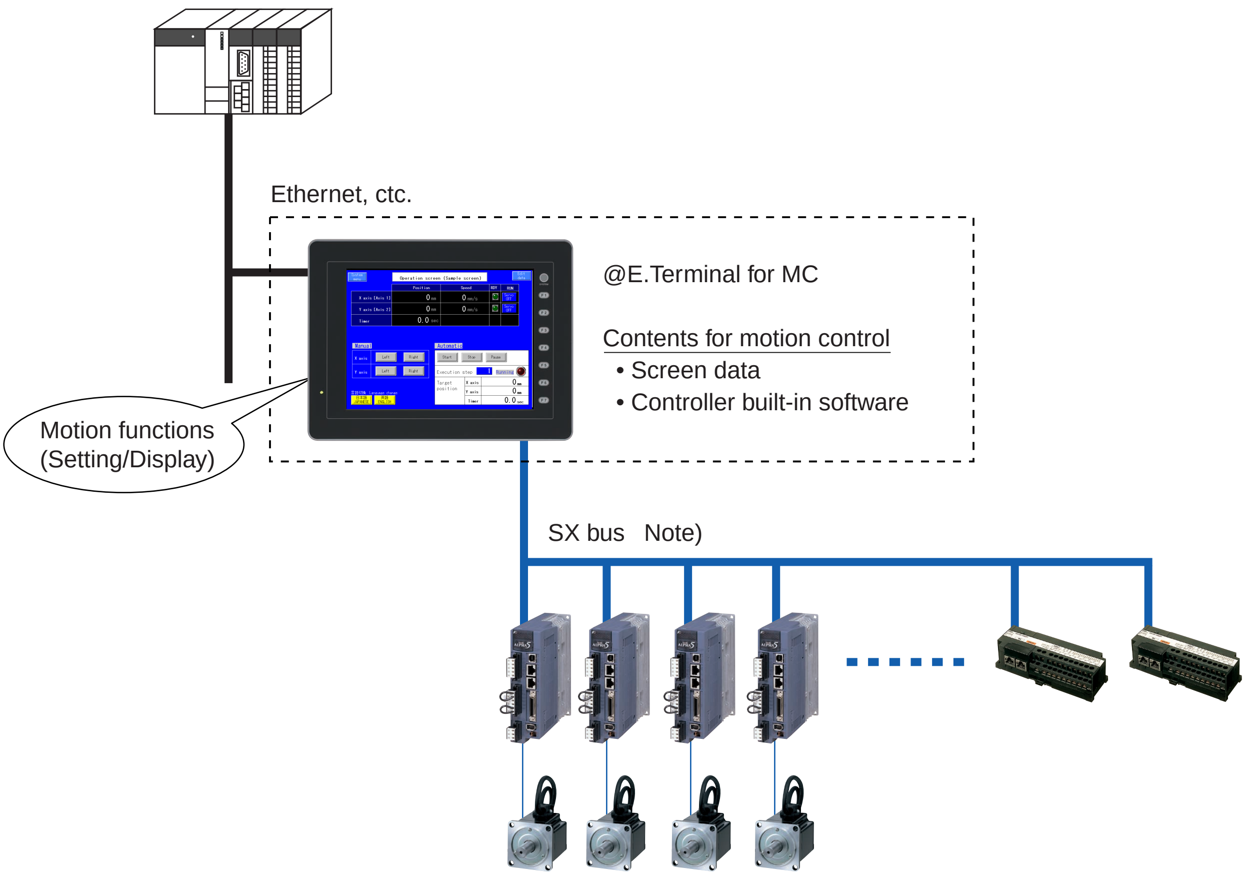
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1-1 Overview of @E.Terminal for MC

The @E.Terminal for MC Display Attached Controller is an all-in-one programmable operation display and motion controller.

Features:

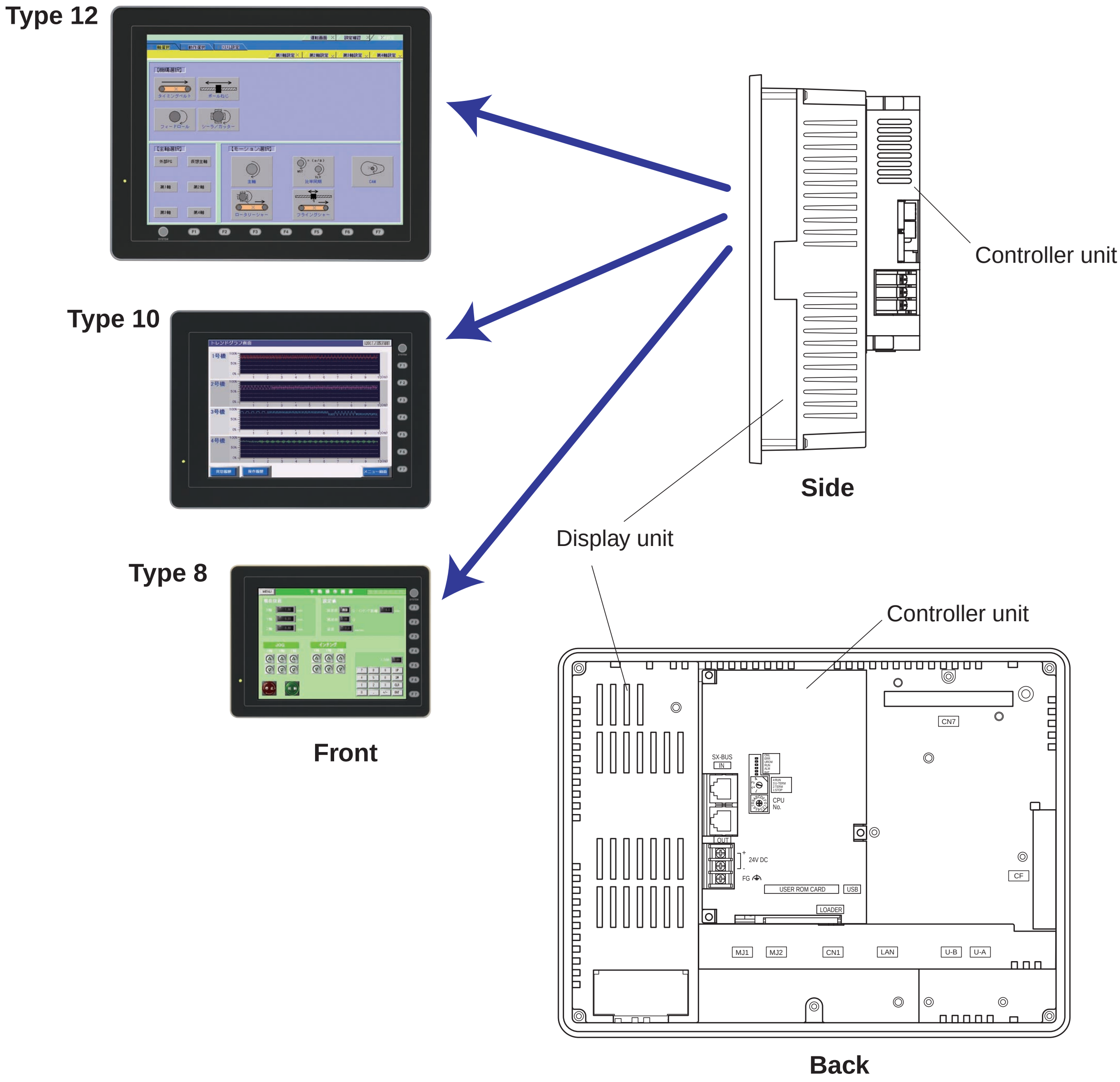
1) The guidance function of the display screen allows you to easily set up parameters and positioning data previously set up by a dedicated machine.
   Also, it enables easy equipment maintenance.
2) The SX bus allows one-touch connection of up to eight servo amplifiers (axes) (FALDIC-α and APLHA5 VS type), minimizing the need for wires.
3) The upper level controller can be connected by Ethernet and the like.
4) The lineup includes three different display screen sizes. 8 inch, 10 inch and 12 inch models are available.
5) The content corresponding to motion is supplied in the standard package.
   Content for PTP control and synchronous control (ratio synchronization, cycle synchronization, flying shear, and rotary shear) are provided.



Note: The SX bus is a MICREX-SX series dedicated high-speed serial bus.

1-2 Appearance

@E.Terminal for MC is composed of a programmable operation display (the display unit) and a controller unit attached to the back of the display unit.
The controller unit is attached with screws to the connector area of the communication unit at the back of the display unit, similar to the way in which the communication unit is attached.



• @E.Terminal for MC

Product types	Display size	Specifications
NP5M0101-5H4	12.1 inches	• TFT color, 800 x 600 dots, DC power supply • Controller unit • Contents of the motion control (Screen data, built in software in the controller)
NP5M0101-4H4	10.4 inches	
NP5M0101-3H4	8.4 inches	

• @E.Terminal (No contents installed)

Product types	Display size	Specifications
NP5N0011-5H4	12.1 inches	• TFT color, 800 x 600 dots, DC power supply • Controller unit • No contents installed
NP5N0011-4H4	10.4 inches	
NP5N0011-3H4	8.4 inches	

• Accessories

Product types	Names	Quantity
NP5M0101-5H4 NP5M0101-4H4 NP5M0101-3H4 NP5N0011-5H4 NP5N0011-4H4 NP5N0011-3H4	Instruction Manual	1
	Backup CD of the @E.Terminal for MC Note1)	1
	SX bus terminating plug	2
	Screw driver	1
	Fixture	4
	Binder for USB cable (Only NP5M0101-3H4/NP5N0011-3H4)	1
	USB cable cramp for port A/B (Only NP5M0101-5H4/4H4, NP5N0011-5H4/4H4)	2
	M3 x 8 screw for USB cable cramp (Only NP5M0101-5H4/4H4, NP5N0011-5H4/4H4)	2
	Noise filter Note2)	1

Note 1: Backup CD is not attached to NP5N0011-5H4/4H4/3H4.
Note 2: Noise filter is not attached from controller unit hardware version “03” or later.

• Screen drawing tools

Names	Types	Specifications
Configuration software: English version	V-SFT-5	Screen editor: Windows98SE/NT4.0/Me/2000/XP/XP64Edition/Vista32-bit compatible
Screen data transfer cable	V-CP	3m, Used for connection between the V8 series and a personal computer.

• Programming support tool for controller

Names	Types	Specifications
SX-Programmer Standard	NP4H-SWN	Programming support tool SX-Programmer Standard, Standard expansion FB, Windows95/98/ME/2000/XP/NT4.0
SX-Programmer Expert (D300win)	NP4H-SEDBV3	IEC61131-3 based on Programming support tool D300winV3, Standard expansion FB, Windows2000/XP/NT4.0
Support tool cable	NW0H-CNV	RS-232C/RS-485 converter for the programming support tool for AT compatible personal computer
	NW0H-CA3	Support tool connection cable (Used to combined the NW0H-CNV)

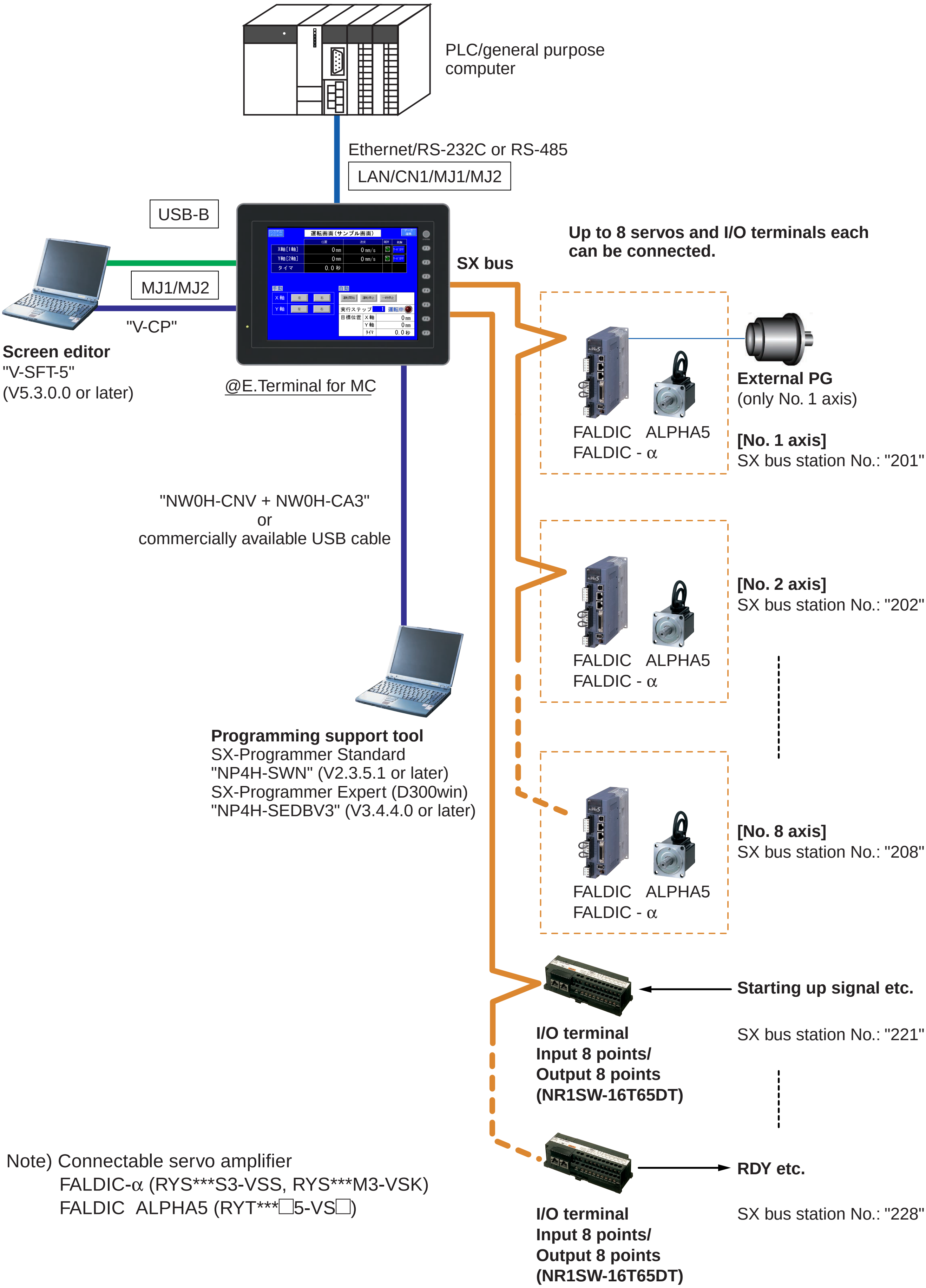
1-3 Types

• Auxiliaries and others

Names	Types	Specifications
Battery for display unit	V7-BT	Replacement lithium primary battery for the V8 series
Replacement backlight for TFT	V812-FL	Replacement backlight for V812 TFT
	V810-FL	Replacement backlight for V810S TFT
	V808S-FL	Replacement backlight for V808S TFT
Battery for controller	NP8P-BT	Primary lithium battery for memory data backup for controller unit
SX bus terminating plug	NP8B-BP	For SX bus loop terminating (1 piece)
SX bus expansion cabl	NP1C-P3	Cable length: 300mm
	NP1C-P6	Cable length: 600mm
	NP1C-P8	Cable length: 800mm
	NP1C-02	Cable length: 2000mm
	NP1C-05	Cable length: 5000mm
	NP1C-10	Cable length: 10000mm
	NP1C-15	Cable length: 15000mm
	NP1C-25	Cable length: 25000mm

* For information about peripheral accessories of the display unit not documented in this manual, please refer to “V8 series Hardware Specifications (2016NEx)”.

The following illustration shows the system composition of @E.Terminal for MC.



Note) Connectable servo amplifier
FALDIC-α (RYS***S3-VSS, RYS***M3-VSK)
FALDIC ALPHA5 (RYT***□5-VS□)

Section 2 Specifications

Page

2-1-1 General specifications

Items		Specifications		
		NP5M0101-5H4 NP5N0011-5H4	NP5M0101-4H4 NP5N0011-4H4	NP5M0101-3H4 NP5N0011-3H4
Physical environmental conditions	Operational ambient temperature	0 to +50 °C		
	Storage ambient temperature	-10 to +60 °C		
	Operational ambient humidity	85 % RH or less (Without dew condensation, max. wet-bulb temperature: 39 °C or less)		
	Operational altitude	2000 m or less above sea level (Transport condition: 70 kPa or more)		
	Operational atmosphere	No corrosive gas, no excessive dust, no conductive dust contamination, and not stained with organic solvents.		
	Pollution degree	2 (Note1)		
Mechanical working conditions	Vibration resistance	Half-amplitude: 0.075 mm, acceleration: 9.8 m/s^2, X, Y, Z: 3 directions for one hour		
	Shock resistance	Peak acceleration: 147 m/s^2, X, Y, Z: 3 directions three times each		
Electrical working conditions	Noise resistance	Rising time: 1 ns, pulse width: 1 µs, Noise voltage: 1.5 kVp-p (Measured by using a noise simulator.)		
	Static electricity discharge resistance	Contact: ±4 kV, air: ±8 kV		
Power supply	Rated input voltage	24V DC (Note2)		
	Rated voltage (tolerance)	24V DC ±10%		
	Permissible momentary power failure	1 ms or less		
	power supply consumption (Max. rated)	42 W or less	37 W or less	35 W or less
	Rush current	170 A or less		
	Input terminal block			
	Display unit	Terminal block screw: M3.5 Tightening torque: 0.8 N·m		- (Connection to the controller unit)
	Controller unit	Terminal block screw: M3 Tightening torque: 0.5 to 0.6 N·m		
	Dielectric strength	500 V AC 1 minute (Between external terminals and frame ground)		
Isolation resistance		500 V DC, 5 MΩ or more		
Dimensions W x H x D (mm)		326.4 x 259.6 x 99.0	303.8 x 231.0 x 99.0	233.0 x 178.0 x 96.0
Mass		Approx. 3.5 kg	Approx. 3.1 kg	Approx. 2.1 kg

Note 1) Pollution degree 2: This pollution does not conduct usually, but under certain circumstances temporary conductivity occurs due to condensation.
Note 2) Use 24V DC power supply which comply to UL standard Class2 insulation.

• Installation specifications

Item		Specifications
Grounding		Less than 100Ω, FG/SG separated
Protection structure	Front panel (Note 1)	Compliant with IP65 (When using waterproof gasket) (Note 2)
Cooling system		Cooling naturally
Structure		Inserted in a mounting panel
Appropriate mounting panel thickness		1.5 to 5 mm

Note: 1) Protection structure for the front when the @E.Terminal is mounted on the mounting panel.
Note: 2) It is recommended to use the mounting panel whose thickness (steel, stainless) is 3.0 mm or more to keep the unit compliant with IP65. The strength differs depending on the material of the mounting panel. Check the environment where the @E.Terminal is used.

2-1 Specifications

2-1-2 Display unit specifications

(1) Display unit specifications

Item	NP5M0101-5H4 NP5N0011-5H4	NP5M0101-4H4 NP5N0011-4H4	NP5M0101-3H4 NP5N0011-3H4
Display device	TFT color		
Display size	12.1-inch	10.4-inch	8.4-inch
Colors	65,536 colors (without blinks) / 32,768 colors (with blinks)		
Display resolution (W x H)	800 x 600 dots		
Dot pitch (W x H)	0.3075 x 0.3075 mm	0.264 x 0.264 mm	0.2135 x 0.213 mm
Backlight	Cold cathode tube		
Backlight life (average life of backlight only)	Approx. 50,000 hours (at the normal temperature of 25° C)		
Backlight auto OFF function	Always ON, random setting		
Brightness adjustment	Function switch: 3 levels / Macro: 128 levels		
Surface sheet material	Polycarbonate, 0.3 mm thick		
POWER lamp	ON: Normal (green) Blink: Backlight error		

(2) Touch switch specifications

Item	Specifications
Method	Analog resistance film type
Number of switches	1024 x 1024
Mechanical life	One million activations or more
Surface treatment	Hard-coated, anti-glare treatment 5 %

(3) Function switch specifications

Item	Specifications
Number of function switches	8 pcs.
Method	Matrix resistance film type
Mechanical life	One million activations or more

(4) Interface specifications

Item			Specifications
D-sub 9-pin (CN1)	Applicable standards		RS-232C, RS-422/485
	Synchronization		Asynchronous type
	Data length		7- or 8-bit
	Parity		None, odd, even
	Stop bit		1- or 2-bit
	Baud rate		4800, 9600, 19200, 38400, 57600, 76800, 115.2kbps (187500 bps for MPI connection (Note))
	Applications		PLC, temperature controller, barcode reader, etc.
Modular jack 8-pin (MJ1/MJ2)	Applicable standards		RS-232C, RS-485 (2-wire connection)
	Applications		Screen data transfer (MJ1), PLC, temperature controller, CREC, barcode reader, V-I/O, Multi-link 2, V-Link, etc.
USB connector (USB-A/B)	USB-A	Applicable standards	Compliant with USB version 1.1
		Baud rate	Low speed: 1.5 Mbps, full speed: 12 Mbps
		Applications	Printer (EPSON PM series), CF card reader/writer
	USB-B	Applicable standards	Compliant with USB version 1.1
		Baud rate	Low speed: 1.5 Mbps, full speed: 12 Mbps
		Applications	Screen data transfer, PictBridge-compatible printer
Ethernet port 100BASE-TX/ 10BASE-T (LAN)	Applicable standards		Compliant with IEEE802.3u (100BASE-TX), IEEE802.3 (10BASE-T)
	Baud rate		100 Mbps, 10 Mbps
	Recommended cable		100 Ω UTP (unshielded twist-pair cable), category 5, max. 100 m long
	Applications		PLC connection, etc.
CF card interface			Compliant with CompactFlash™
Extensional communication port (CN5)			Controller unit connection (The communication unit is not connectable.)
Optional unit port (CN7)			RGB input/output, video, sound (The optional unit "GU-xx" is necessary.)

Note) For details, refer to the User's Manual <V8 Series Connection Manual> (2201NEx).

(5) Clock and backup memory specifications

Item	Specifications
Battery specification	Coin-type lithium primary cell
Backup memory	SRAM 512 kbytes
Backup period	Approx. 5 years (Ambient temperature at 25 °C)
Battery voltage drop detection	Provided (Internal memory of $s167 allocated)
Calendar accuracy	Monthly deviation ±90 s (Ambient temperature at 25 °C) (Note)

Note) Time loss is approximately 90 seconds a month in an ambient temperature of 25 °C in the non-energized state (backup with battery). Depending on the ambient temperature, the calendar may lose 356 seconds or advance 189 seconds in a month at the maximum. Correct the clock periodically.

2-1 Specifications

(6) Drawing environment

Item	Specifications
Drawing method	Exclusive configuration software
Drawing tool	Name of exclusive configuration software: V-SFT-5 Personal computer: Pentium III 800 MHz or above (Pentium IV 2.0 GHz or above recommended) OS: Windows98SE/NT4.0/Me/2000/XP/XP64 Edition/Vista 32-bit Capacity of hard disk required: Free space of approx. 850 Mbytes or more Display: Resolution 1024 x 800 or above Screen color: 16 bits or more

(7) Display function specifications

Item		Specifications				
Interface language (Note: 1)		Japanese	English/ Western Europe	Chinese (Traditional)	Chinese (Simplified)	Korean
Characters	1/4-size, 1-byte	ANK code	Latin 1	ASCII code	ASCII code	ASCII code
	2-byte 16-dot	JIS #1, 2 levels	-	Chinese (traditional)	Chinese (simplified)	Hangul (without Kanji)
	2-byte 32-dot	JIS #1 level	-	-	-	-
Font		Windows font Stroke font (under development)				
Character size	1/4-size	8 x 8 dots				
	1-byte	8 x 16 dots				
	2-byte	16 x 16 dots or 32 x 32 dots				
	Enlargement factor	X: 1 to 8 times, Y: 1 to 8 times Point (Note: 2) : 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 36, 48, 72				
Number of displayable characters	Display resolution	800 x 600				
	1/4-size	100 characters x 75 lines				
	1-byte	100 characters x 37 lines				
	2-byte	57 characters x 37 lines				
Character properties		Display properties: Normal, reverse, blink, bold, shadow, transparent Colors: 65,536 colors (without blinks) / 32,768 colors (with blinks)				
Graphics		Lines: Line, continuous line, box, parallelogram, polygon Circles: Circle, arc, sector, ellipse, elliptical arc Others: Tile patterns				
Graphic properties		Line types: 6 (thin, thick, dot, chain, broken, two-dot chain) Tile patterns: 16 (incl. user-definable 8 patterns) Display properties: Normal, reverse, blink Colors: 65,536 colors (without blinks) 32,768 colors (with blinks) Color selection: Foreground, background, boundary (line)				

Note: 1) In addition, the following fonts are available.
Gothic, English/Western Europe HK Gothic, English/Western Europe HK Times, Central Europe, Cyrillic, Greek, Turkish. For more information, refer to the “V8 series Reference Manual.”
Note: 2) Applicable when Gothic font, Windows font or stroke font is used.

(8) Function performance specifications

Item		Specifications
Screens		Max. 1024
Screen memory		Flash memory: Approx. 12.5 Mbytes (Varies depending on the font)
Switch		1024 per screen
Switch actions		Set, reset, momentary, alternate, to light (Possible to press a function switch and a switch on the display at the same time)
Lamp		Reverse, blink, exchange of graphics 1024 per screen
Graph		Pie, bar, panel meter and closed area graph:No limitation Statistics and trend graphs: Max. 256 per layer (Note: 2)
Data setting	Numerical data display	No limitation
	Character display	No limitation
	Message display	Display resolution: 800 x 600: Max. 100 characters (1-byte) No limitation
Sampling		Sampling display of buffer data (Constant sampling, bit synchronization, alarm logging, time order alarming, alarm function)
Graphic library		Max. 2560
Overlap library		Max. 1024
Data blocks		Max. 1024
Messages		Max. 32768 lines
Patterns		Max. 1024
Macro blocks		Max. 1024
Page blocks		Max. 1024
Direct blocks		Max. 1024
Screen blocks		Max. 1024
Data sheets		Max. 1024
Screen library		Max. 1024
Comments		Max. 32768
Device memory map		Max. 32 x 8 (PLC1 to PLC8)
Time display		Provided
Hard copy		Provided
Buzzer		Provided, 2 sounds (short beep, long beep)
Auto OFF function		Always ON, random setting
Self-diagnostic function		Switch self-test function Communication parameter setting check function Communication check function

Note: 1) The number of setting memory locations is limited to 1024 per screen.
Note: 2) Layer: 4 per screen (base + 3 overlap displays)

2-1 Specifications

2-1-3 Controller unit specifications

(1) Application performance specifications

Item			Specifications	
Type			NP5M0101-5H4/4H4/3H4	NP5N0011-5H4/4H4/3H4
Control system			Stored program, Cyclic scanning system (default task), periodic task, event task	
Input / Output connection method			Direct input / output (SX bus)	
I/O control system			Via SX bus: Synchronous refresh with takt	
CPU			32-bit RISC processor	
Memory types			Program memory, data memory, temporary memory	
Programming language			<When used the D300win> IL language (Instruction List) ST language (Structured Text) LD language (Ladder Diagram) FBD language (Function Block Diagram) SFC elements (Sequential Function Chart)	<When used the Standard Loader> LD language ST language
Program memory capacity			49152 steps	
Memory	I/O memory		512 words (Up to 256 words, useable I/O memory on the @E.Termina for MC.)	
	General memory		65536 words	
	Retain memory		22528 words	8192 words
	User FB instance memory		4096 words	8192 words
	Memory for System FB		6144 words	16384 words
		Timer	256 points	512 points
		Integrating timer	64 points	128 points
		Counter	128 points	256 points
		Edge detection	512 points	1024 points
		Others	2048 words	8192 words
	System memory		512 words	
No. of tasks			Default tasks (Cyclic scanning): 1 Periodic tasks: 4 Event tasks : 4 (Total of 4 tasks when periodic task is used)	
No. of programs			Max. 256 (Max. 128 for one task)	
Diagnosis function			Self diagnosis (memory checking, ROM sum checking), system configuration monitoring, module fault monitoring	
Secret preserving function			By password (set with the support tool)	
Calendar			Available up to 12/31/2069 23:59:59 Precision: ± 27 s/month (at 25 °C, when active)	
Backup of application program			Flash ROM built in CPU module Backup area: Application program, system definition, ZIP file	
User ROM function			Application programs, system definitions, zipped files and compressed projects can be stored in user ROM cards.	
Backup of data memory	Backup area		Retain memory, retain attributed memory (e.g. current value of counter), calendar IC memory, RAS area	
	Battery		Lithium primary cell, replacement time: 5 minutes or less (at 25 °C)	
	Backup period		Approx. 5 years (at 25 °C)	

Note: The application specifications of the controller unit are equivalent to those of the NP1PM-48R MICREX-SX series CPU module. For more information on memory, language, and system definition, please refer to “User’s Manual Instruction Edition, MICREX-SX series” as appropriate for your programming support tool.
- SX-Programmer Standard FEH588
- SX-Programmer Expert (D300win) FEH200

(2) Specific system memory

The table below lists system memory specific to @E.Terminal controller unit.

[Expansion annunciator relay area]

Address	Names	Descriptions
SM1240 (%MX10.124.0)	Display unit connection status flag	Represents whether a display unit is connected (ON/OFF of display unit power supply). 1: Connected 0: None

[Cause of memory error]

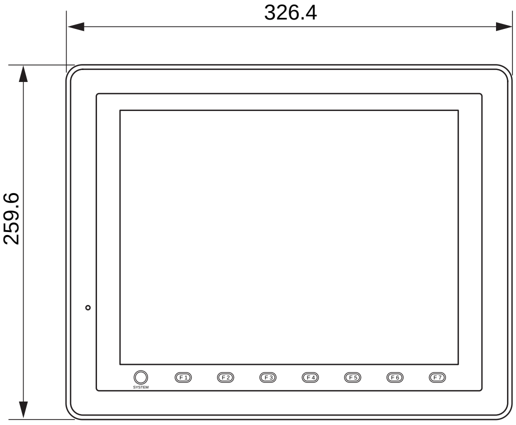
Address	Names	Descriptions	Level
SM84 (%MX10.8.4)	Display unit DPRAM error	Turns ON when an error occurs in DPRAM for display unit I/F in controller unit.	Fatal fault

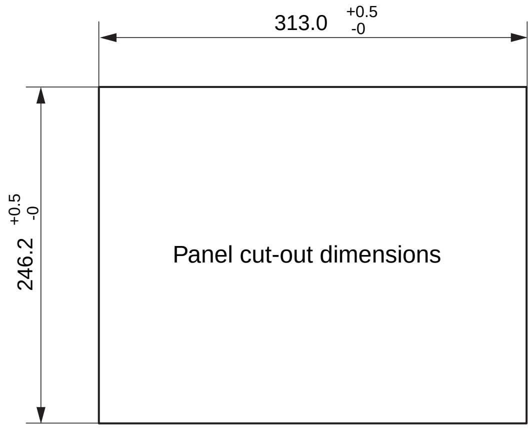
2-2 Dimensions and Panel Cut-out

2-2-1 External dimensions and panel cut-out dimensions for the NP5M0101-5H4/NP5N0011-5H4

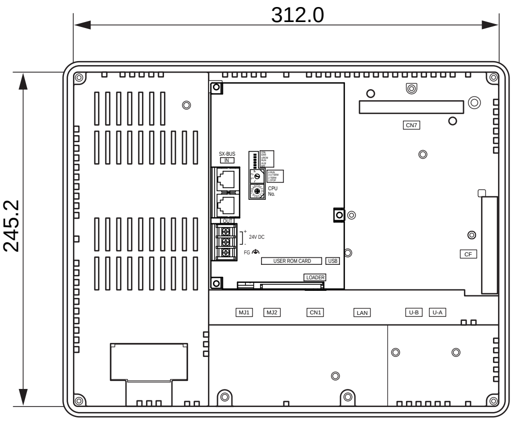
(Unit: mm)

• Front view

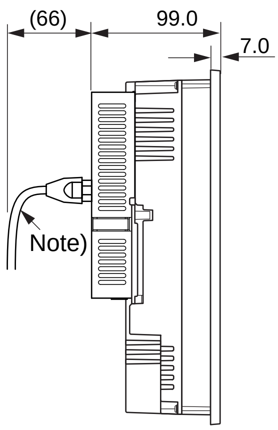




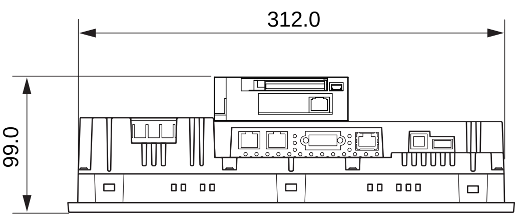
• Rear view



• Side view



• Bottom view

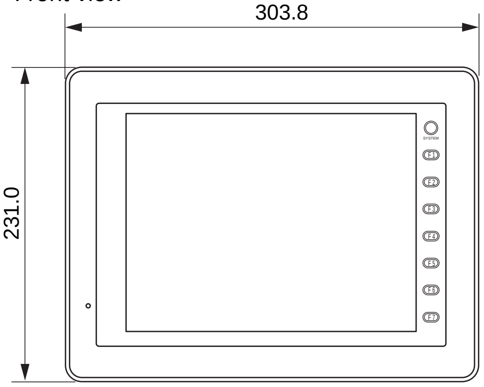


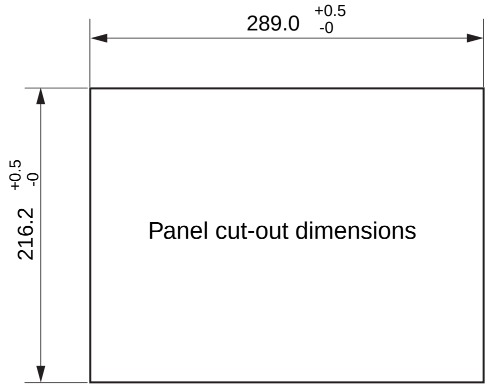
Note: Arrange SX bus expansion cable so that radius of bend in the cable is at least 50mm. Plug/unplug the SX bus expansion cable in the perpendicular direction.

2-2-2 External dimensions and panel cut-out dimensions for the NP5M0101-4H4/NP5N0011-4H4

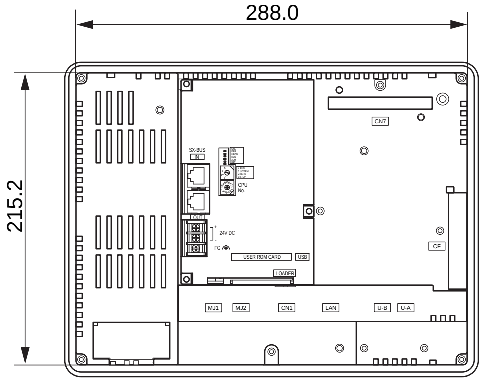
(Unit: mm)

• Front view

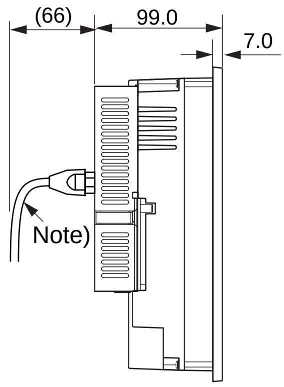




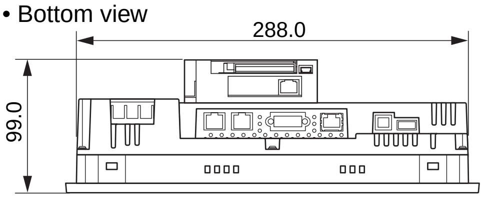
• Rear view



• Side view



• Bottom view



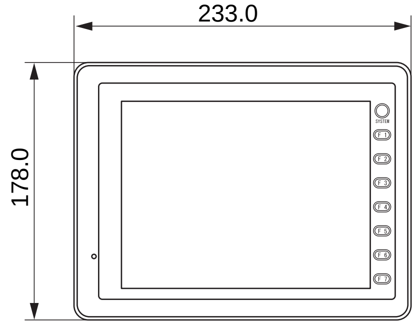
Note: Arrange SX bus expansion cable so that radius of bend in the cable is at least 50mm. Plug/unplug the SX bus expansion cable in the perpendicular direction.

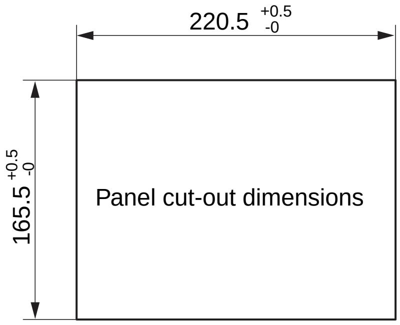
2-2 Dimensions and Panel Cut-out

2-2-3 External dimensions and panel cut-out dimensions for the NP5M0101-3H4/NP5N0011-3H4

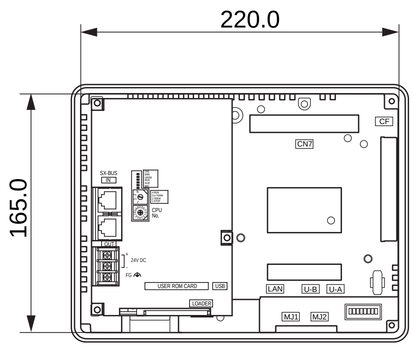
(Unit: mm)

• Front view

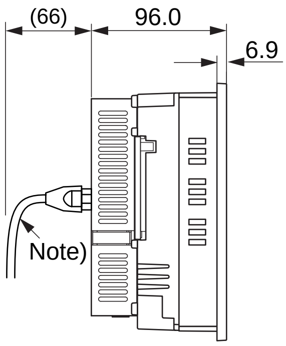




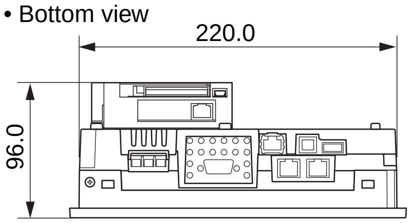
• Rear view



• Side view



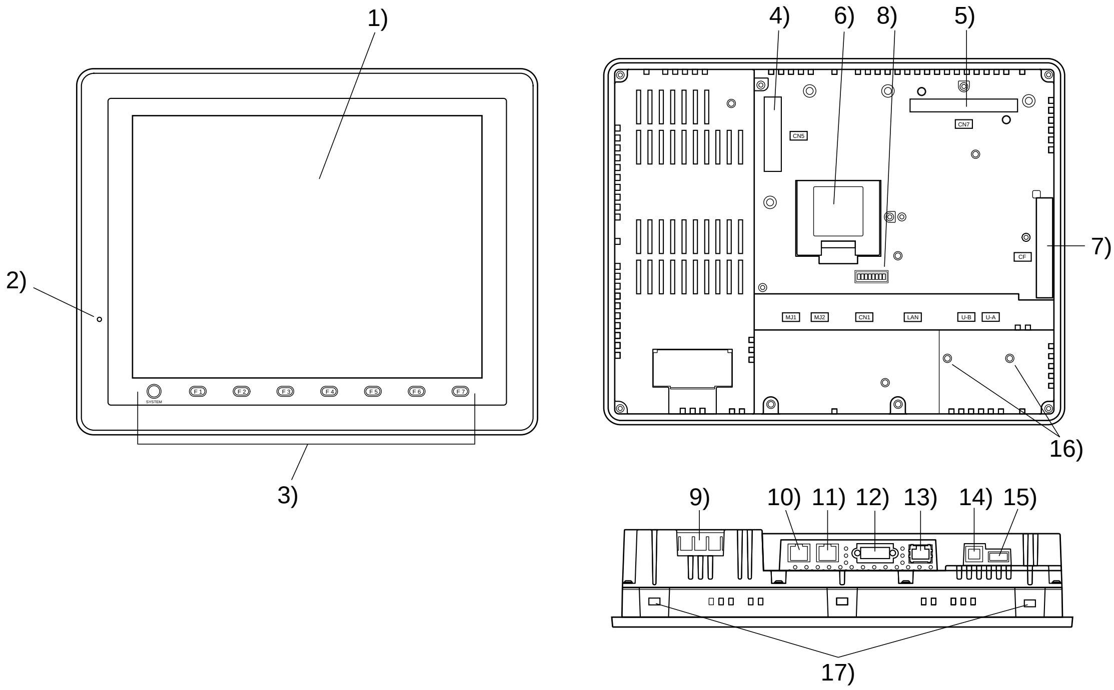
• Bottom view



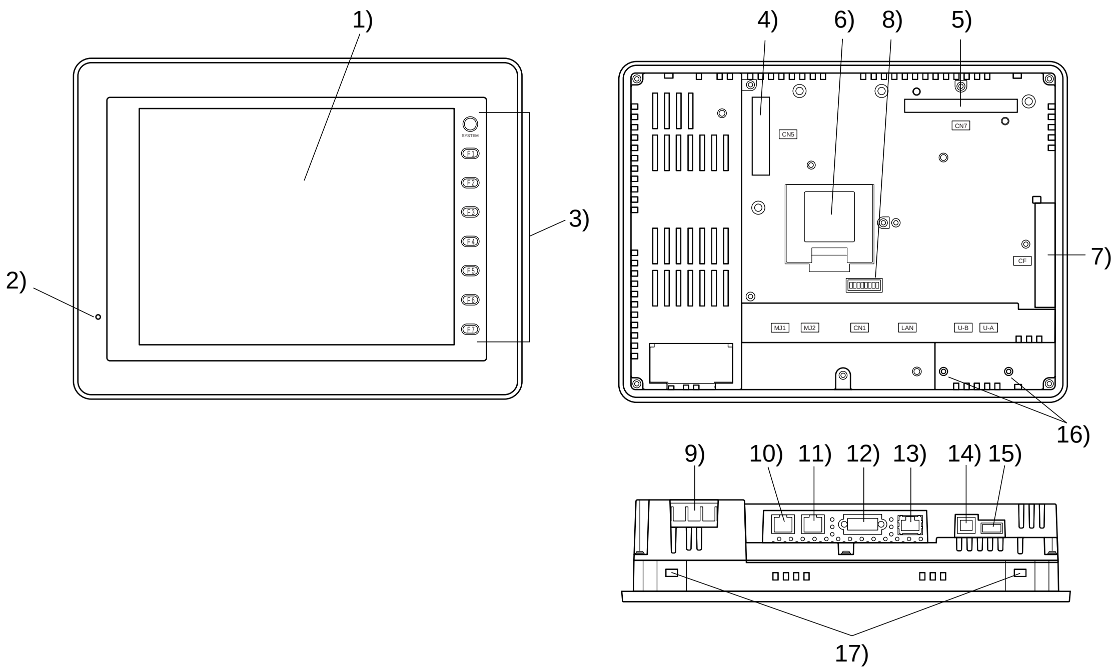
Note: Arrange SX bus expansion cable so that radius of bend in the cable is at least 50mm. Plug/unplug the SX bus expansion cable in the perpendicular direction.

2-3-1 Display unit

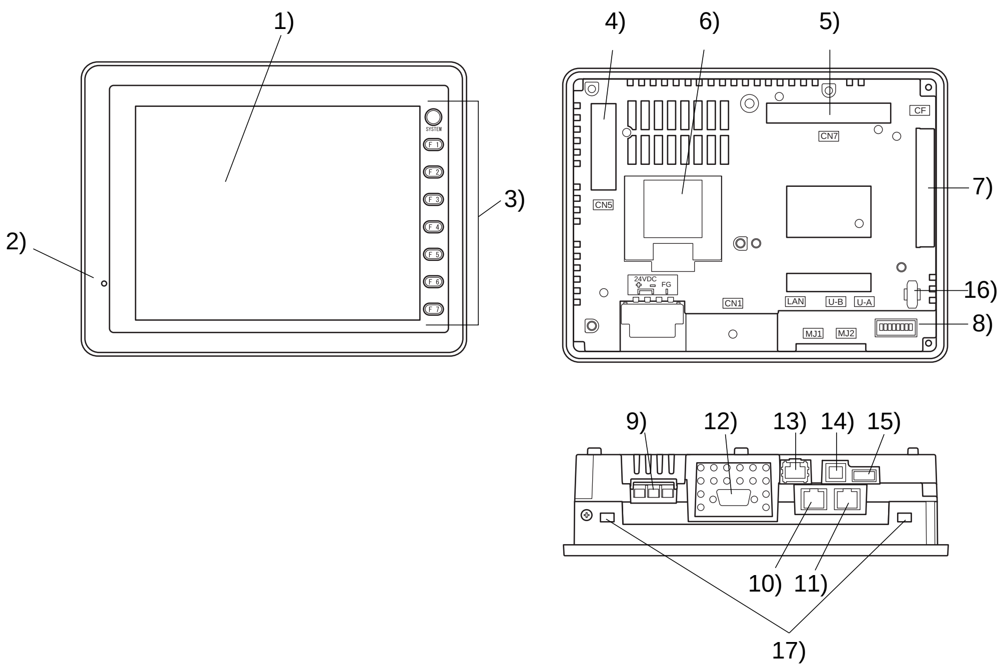
(1) NP5M0101-5H4/NP5N0011-5H4



(2) NP5M0101-4H4/NP5N0011-4H4



(3) NP5M0101-3H4/NP5N0011-3H4



1) Display
This is the display unit.

2) Power lamp (POWER)
Illuminates in green when the display unit is powered on, and is operating normally. Flashes when an error occurs to the backlight (burned-out backlight, etc.).

3) Function keys
Used for RUN/STOP selection, brightness adjustment and backlight ON/OFF (setting on the V-SFT-5 editor required). These switches can be used as user-defined switches in the RUN mode.

4) Communication interface unit connector (CN5)
Connects with the controller unit.

- * Hidden by the controller unit.

5) Optional unit connector (CN7)
Used for mounting the optional unit “GU-xx” for video input, sound output, RGB input or RGB output.

6) Battery holder
Contains a backup battery for SRAM and clock.
When the battery voltage drops, replace the battery with a new one (V7-BT).

- * Hidden by the controller unit. Replace battery by detaching the controller unit.

7) CF card connector (CF)
This is the connector where the CF card is inserted. Access to the CF card is enabled when the cover is closed.

8) Dip switch
8-bit Dip switch used for setting terminating resistance of the CN1 signal line and the MJ1/MJ2 RS-485 signal line.

- * In NP5M0101-5H4/4H4, NP5N0011-5H4/4H4, the dip switch is hidden by the controller unit. Operate dip switch by detaching the controller unit.

9) Power supply terminal block (display unit)
Supplies the power to the display unit (24 V DC).

10) Modular jack 1 (MJ1)
Used for screen data transfer and connection with PLCs or other peripheral devices.

11) Modular jack 2 (MJ2)
Used for connection with PLCs or other peripheral devices.

12) PLC communication connector (CN1)
Used for connection with a controller (PLC, temperature controller, inverter, etc.).

13) 100BASE-TX/10BASE-T connector (LAN)
Used for Ethernet connection.

14) USB-B (slave port)
Used for screen data transfer or connection with a PictBridge-compatible printer.

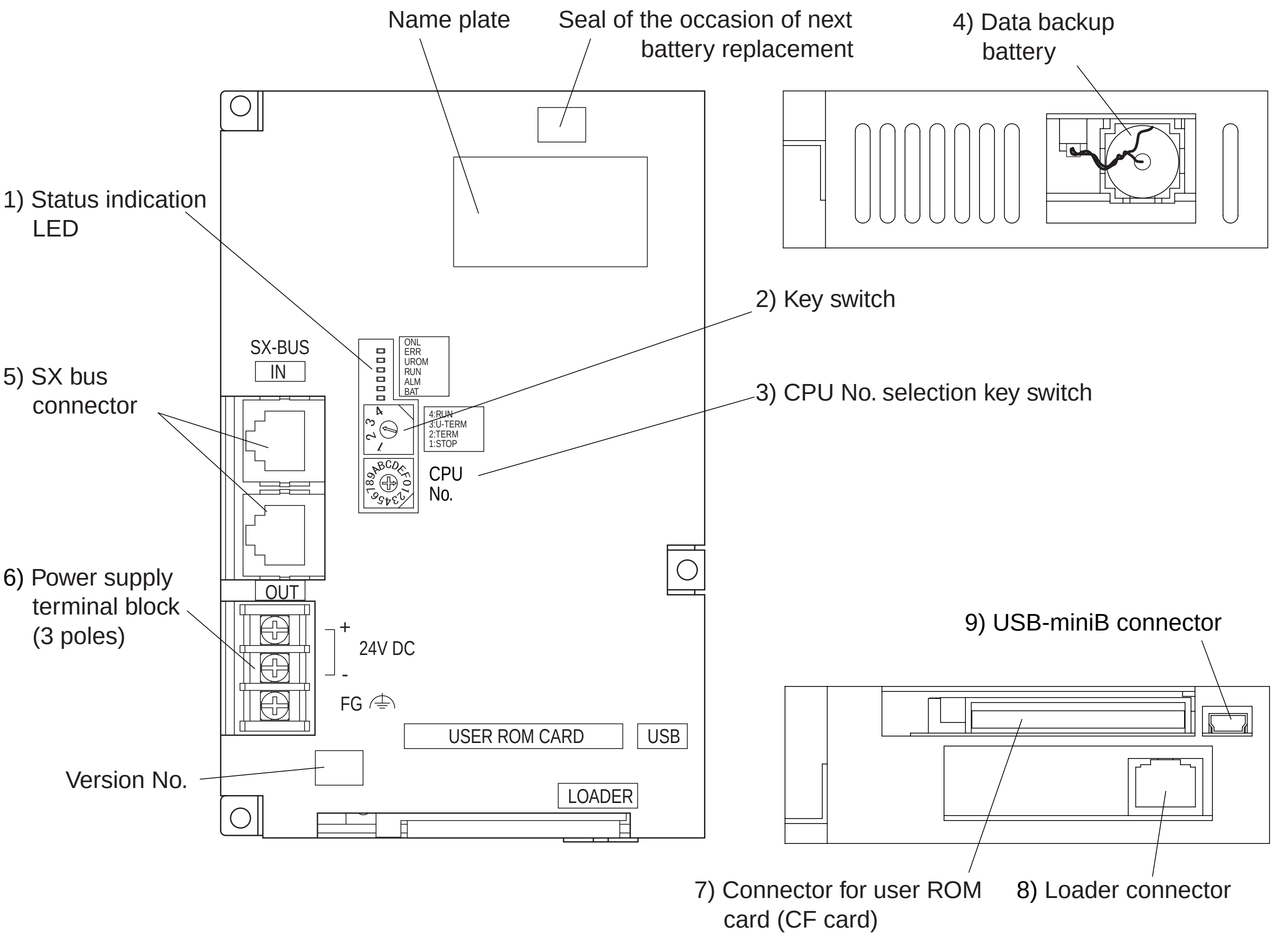
15) USB-A (master port)
This is the connector where a printer or a CF card reader/writer is connected.

16) USB cable clamp mounting hole
For NP5M0101-5H4/4H4, NP5N0011-5H4/4H4, this hole is used for attaching a USB cable clamp.
For NP5M0101-3H4/NP5N0011-3H4, this hole is used for attaching a USB cable binder.

17) Mounting holes
Used for inserting fixtures when securing the @E.Terminal to the mounting panel.

2-3 Names and Functions

2-3-2 Controller unit



1) Status indication LED (Controller unit)

<table>
<tr><th>Symbol</th><th>Color</th><th>Descriptions</th></tr>
<tr><td>ONL
ERR</td><td>Green
Red</td><td>Status of the controller unit.

<Lights on pattern>
<table><tr><td>ONL</td><td>ERR</td><td>Status of controller unit</td></tr><tr><td>OFF</td><td>OFF</td><td>Power OFF, system resetting or initializing</td></tr><tr><td>Blinks</td><td>-</td><td>SX bus standing on</td></tr><tr><td>ON</td><td>OFF</td><td>Normally running</td></tr><tr><td>ON</td><td>ON</td><td>Nonfatal fault, at a running</td></tr><tr><td>OFF</td><td>ON</td><td>Fatal fault at a stop</td></tr></table></td></tr>
<tr><td>UROM</td><td>Green</td><td>Lights on continuously when the CPU recognizes a user ROM card.
Lights on continuously when a user ROM card (compact flash card) is correctly installed in the CPU module and the key switch is set to "3" or "4".</td></tr>
<tr><td>RUN
ALM</td><td>Green
Red</td><td>Status of system of the conntroller unit.
(Note)

<Lights on pattern>
<table><tr><td>RUN</td><td>ALM</td><td>Status of system</td></tr><tr><td>OFF</td><td>OFF</td><td>Power OFF or application program at a stop</td></tr><tr><td>ON</td><td>OFF</td><td>Normally running</td></tr><tr><td>ON</td><td>ON</td><td>Nonfatal fault, at a running</td></tr><tr><td>OFF</td><td>ON</td><td>Fatal fault, at a stop</td></tr><tr><td>Blinks</td><td>-</td><td>While the CPU is accessing the user ROM</td></tr></table></td></tr>
<tr><td>BAT</td><td>Orange</td><td>Turned on when data backup battery dropped or disconnected.</td></tr>
</table>

Note: The system includes the own CPU.

2) Key switch (Controller unit)
Selects the running mode of the controller unit.
1: STOP 2: TERM 3: U-TERM 4: RUN
* The shipment default is 3 (U-TERM).

3) CPU No. selection key switch
Sets the CPU number of the controller unit. Set the number to “0”.

4) Data backup battery (Controller unit)
The battery backs up the retain memory of the contoller uint.

5) SX bus connector (IN, OUT)
Be sure to connect cable from OUT to IN.
For the connection cable, use a dedicated SX bus extension cable.

6) Power supply terminal block (Controller unit)
Supplies the power to the display unit (24 V DC).

7) Connector for user ROM card (CF card) (Controller unit)
This is the connector where the User ROM card (CF card) is inserted.

8) Loader connector
For the personal computer loader, use a RS-232C port.

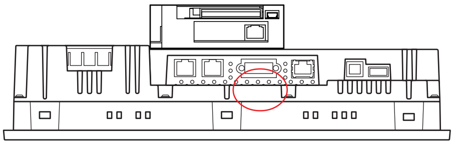
9) USB-miniB connector (Controller unit)
Connects to the USB port of a personal computer loader.
Please use a commercially sold USB cable (male A connector _ male miniB connector).

2-4 Serial Connector

Communication (RS-232C, RS-422/485) with a controller is enabled via the serial connector (CN1).

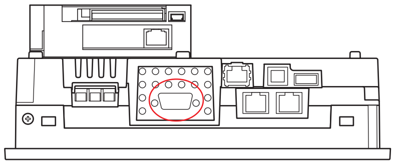
- **For NP5M0101-5H4/4H4**
  NP5N0011-5H4/4H4

Bottom view



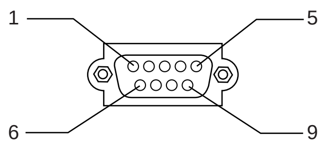
- **For NP5M0101-3H4**
  NP5N0011-3H4

Bottom view



The serial connector pins correspond to signals as given below.

CN1 (D-sub 9-pin, female)



Pin No.	RS-232C (Note: 1)		RS-422 / RS-485 (Note: 1)	
	Signal	Contents	Signal	Contents
1	NC	Not used	+RD	Receive data (+)
2	RD	Receive data	-RD	Receive data (-)
3	SD	Send data	-SD	Send data (-)
4	NC	Not used	+SD	Send data (+)
5	SG	Signal ground	SG	Signal ground
6	NC	Not used	+RTS	Request to send (+)
7	RTS	Request to send	-RTS	Request to send (-)
8	CTS	Clear to send	NC	Not used
9	NC	Not used	+5V	Use prohibited (Note: 2)

Note: 1) The signal level can be changed between RS-232C and RS-422/485 on the configuration software.
When RS-232C is selected, set the dip switches 5 and 7 to the OFF position.
(For more information on the dip switch, refer to “Chapter 2-6”.)
Note: 2) When RS-422/485 is selected, +5V is output from pin No. 9.
+5V is used as the power supply for the external terminating resistance for RS-422/485 communication.
It cannot be used as an external power supply.

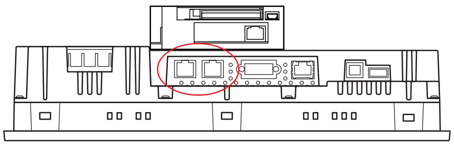
Recommended connector
The following connector is recommended for a self-made cable.

Recommended connector	DDK's 17JE-23090-02 (D8C) -CG	D-sub 9-pin / male / inch screw thread (#4-40UNC) type / with hood / lead- and cadmium-free

A screen data transfer cable (MJ1 only), temperature controller, barcode reader, CREC, or V-I/O can be connected to the modular jack (MJ1 or MJ2).

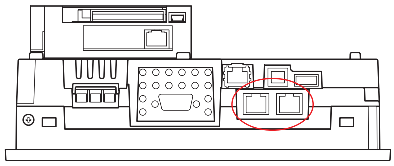
- **For NP5M0101-5H4/4H4**
  NP5N0011-5H4/4H4

Bottom view

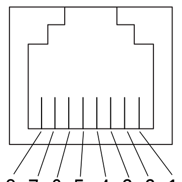


- **For NP5M0101-3H4**
  NP5N0011-3H4

Bottom view



Pins of MJ1 and MJ2 correspond to signals as given below.

MJ1/2	Pin No.	Signal	Contents
	1	+SD/RD	RS-485 + data
	2	-SD/RD	RS-485 - data
	3	+5V	Externally supplied +5 V (Note: 1)
	4	+5V	
	5	SG	Signal ground
	6	SG	
	7	RD	RS-232C receive data
	8	SD	RS-232C send data

Note: 1) Allowable current for the external power supply +5V at MJ1/MJ2/USB-A of the @E.Terminal.
- For MJ1 and MJ2, the maximum allowable current is 150 mA in total.
- When connecting an optional unit or communication unit, be careful not to exceed the total allowable current (650 mA) for USB-A, MJ1 and MJ2.

2-6 Dip Switches

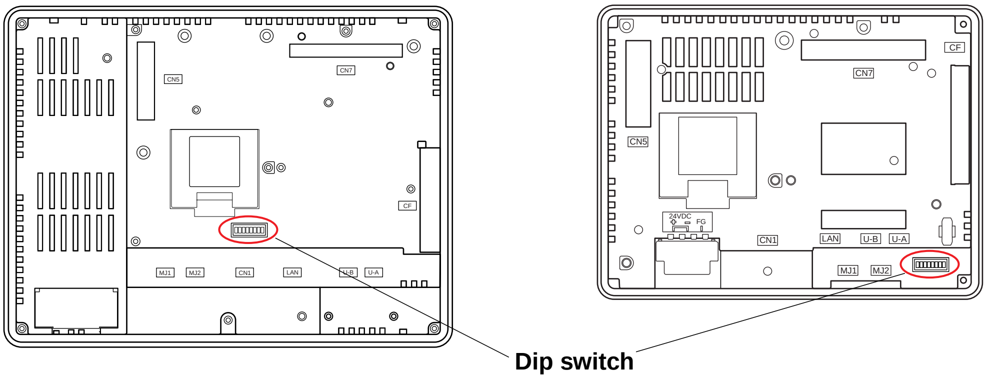
In NP5M0101-5H4/4H4, NP5N0011-5H4/4H4, the dip switch is hidden by the controller unit.
Operate the dip switch by detaching the controller unit.
The @E.Terminal is equipped with eight (1 to 8) dip switches. When setting the dip switch, turn the power off.
Upon delivery, all the dip switches are set to OFF.

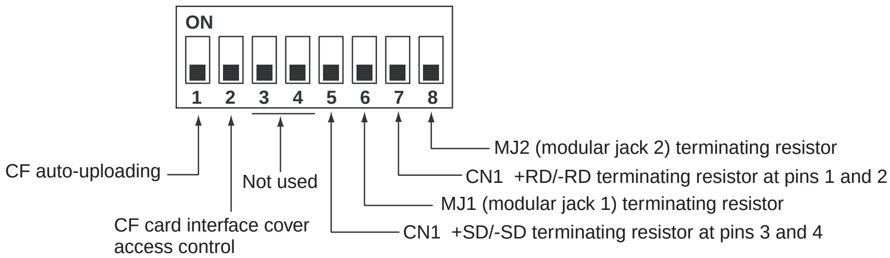
• For NP5M0101-5H4/4H4
NP5N0011-5H4/4H4

Rear view

• For NP5M0101-3H4
NP5N0011-3H4

Rear view





Dip switch number 1 (Note:) **(CF Auto-uploading)**

Set the dip switch number 1 to the ON position when auto-uploading a screen data file saved on a CF card.

Procedure

1. Have a CF card

Have a CF card to which the screen data is loaded using the V-SFT-5 editor. (For the loading procedure, refer to the “V8 series Reference Manual.”)

2. Insert a CF card

Turn the power of the display unit off, and set the dip switch number 1 to the ON position. Open the CF card interface cover, and insert a CF card.

3. Auto-uploading starts

Turn the power of the display unit on. The screen data is automatically loaded into the FLASH memory of the unit.

Note: Be sure to set the dip switch number 1 to the OFF position if you do not use CF auto-uploading function.

Dip switch number 2 (CF Card interface cover access control)

⚠ **Caution**	When the dip switch number 2 is set to the ON position, access to the CF card is possible whether the cover is opened or not. In case access to the CF card is disabled because of damage of the CF card interface cover, set the dip switch number 2 to the ON position. Normally keep it in the OFF position.

With the dip switch number 2, the LED status when the CF card interface cover is opened can be set.

Dip switch number 2	LED	Contents
OFF	Not lit	Access to the CF card is not performed. CF card can be removed.
	Lights up in red	Accessing the CF card. After the access is finished, the LED goes off.
ON	Lights up in red	Access to the CF card is possible at all times.

Dip switch number 3, 4 (Not used)

Set the dip switch number 3 and 4 to OFF.

Dip switch number 5, 6, 7, 8 (Terminating resistor setting)

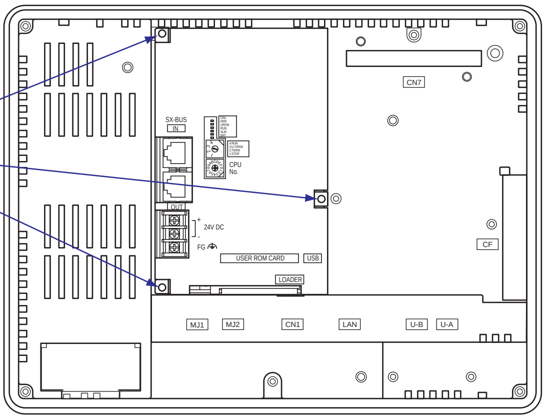
⚠ **Caution**	When connecting a controller at CN1 via RS-232C, set the dip switch number 5 and 7 to the OFF position.

- When connecting a controller at CN1 via RS-422/485 (2-wire connection), set the dip switch number 7 to the ON position.
- When connecting a controller at CN1 via RS-422/485 (4-wire connection), set the dip switch number 5 and 7 to the ON position.
- For the following connections at modular jack 1 or 2, set the dip switch number 6 or 8 to the ON position.
  - Master station for multi-link 2 connection
  - Connection with a controller (PLC, temperature controller, etc.) via RS-485
  - Connection with the card recorder “CREC” (optional)
  - Connection with the serial extension I/O “V-I/O” (optional)
  - Connection to the @E.Terminal at the termination of V-Link connection via RS-485

* **Detaching controller unit**

To operate the dip switch in NP5M0101-5H4/4H4, NP5N0011-5H4/4H4, remove the controller unit.
Remove mounting screws at three places to remove the controller unit from the display unit.
Be careful not to drop or lose the mounting screws.

Mounting screws at three places
(M3 screws thread,
Tightening torque:
0.5 to 0.7N·m)



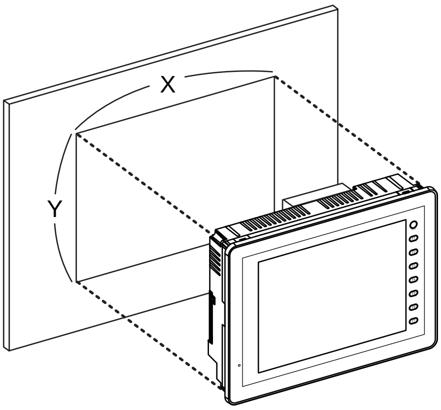
Section 3 Installation

Page

3-1 Mounting Procedure

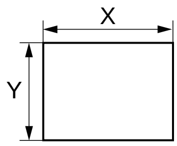
(1) Mounting procedure

1) Insert the @E.Terminal unit into the mounting panel (max. thick: 5 mm).



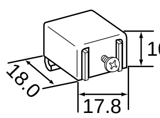
Panel cut-out dimensions   Unit: mm

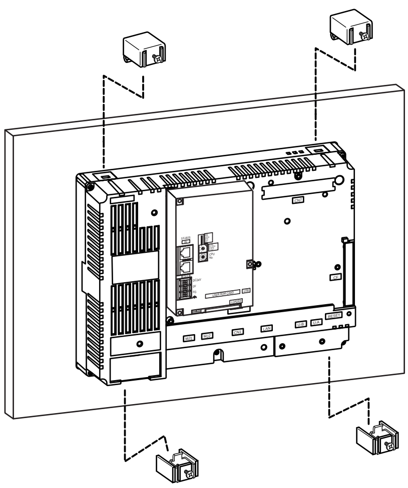
Types	X	Y
NP5M0101-5H4/NP5N0011-5H4	313.0 $^{+0.5}_{-0}$	246.2 $^{+0.5}_{-0}$
NP5M0101-4H4/NP5N0011-4H4	289.0 $^{+0.5}_{-0}$	216.2 $^{+0.5}_{-0}$
NP5M0101-3H4/NP5N0011-3H4	220.5 $^{+0.5}_{-0}$	165.5 $^{+0.5}_{-0}$



2) Insert four fixtures attached to the @E.Terminal unit into the mounting holes, and tighten them with the tightening screws.
Tightening torque: 0.5 to 0.7 N·m

Fixture dimensions
(Unit: mm)



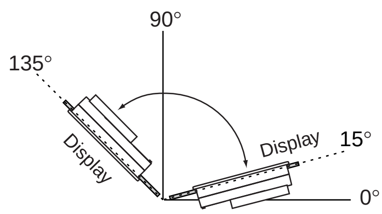


* When the @E.Terminal unit is attached to the mounting panel, the fixtures and frame grounds (FG) are connected. To prevent static electricity, be sure to connect the mounting panel to the frame ground.

3) Mount the gasket so that it will be sandwiched securely between the @E.Terminal unit and the mounting panel.

(2) Mounting angle

Install the unit within the angle of 15° to 135° as shown on the right.



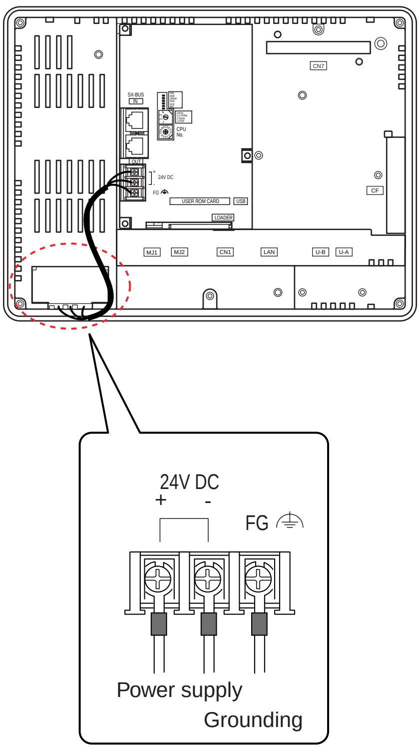
3-2 Power Supply Cable Wiring

⚠	**Warning**	Electric shock hazard. Shut the power off before wiring the power supply cable.

(1) Power supply cable wiring
Power supply terminal blocks of the display unit and the controller unit are connected with each other with a cable by default. Use one power supply terminal block to connect the power supply cable.

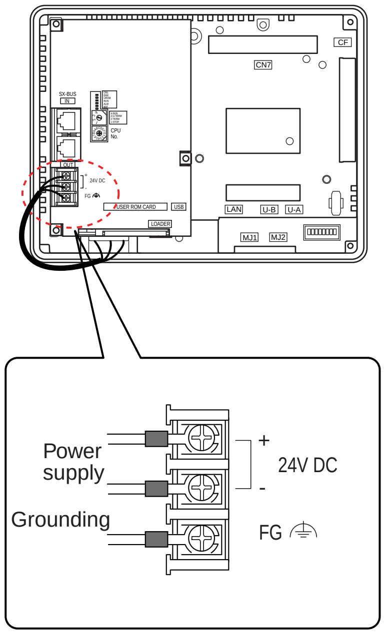
• For NP5M0101-5H4/4H4
NP5N0011-5H4/4H4

Connect the power supply cable to the power supply terminal block of the display unit.

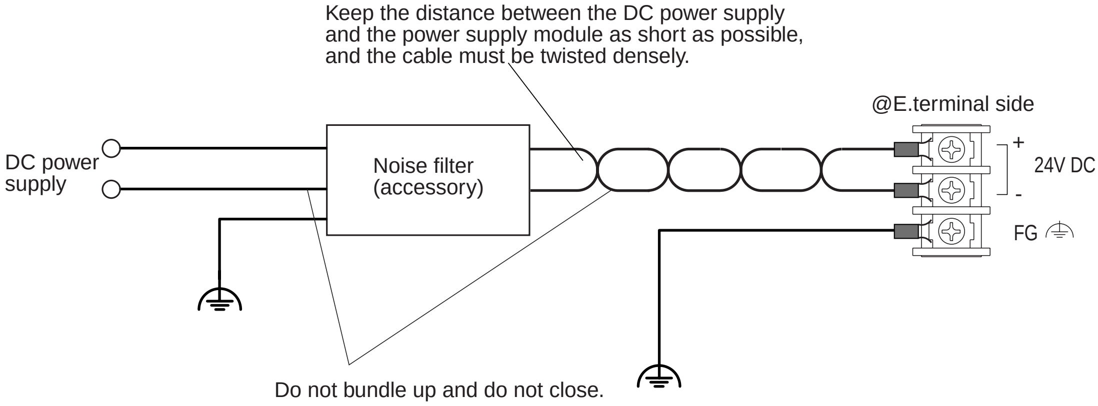


• For NP5M0101-3H4
NP5N0011-3H4

Connect the power supply cable to the power supply terminal block of the controller unit.

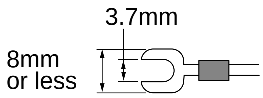
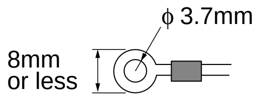
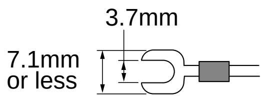
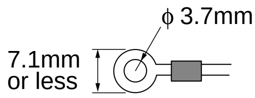


• Attaching noise filter
Attach accompanying noise filter to the power supply cable between the DC power supply and the power supply terminal block.



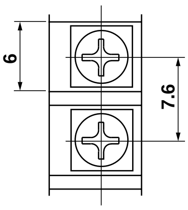
* Noise filter is not required for controller unit hardware version “03” or later.
Noise filter is not attached as accessory with above version.

- Tighten terminal screws on the power supply terminal block of the display unit with the following torque.
  Use a power supply cable within the range shown below.

Types	Tterminal screw			Power Cable
	Screw size	Tightening torque	Crimp-style terminal	
NP5M0101-5H4 NP5M0101-4H4 NP5N0011-5H4 NP5N0011-4H4	M3.5	0.8N·m	 	AWG18 - 16
NP5M0101-3H4 NP5N0011-3H4	M3.5	1.2N·m	 	AWG16 - 14

- The power supply terminal block of the controller unit uses M3 terminal screws. Their tightening torque should be 0.5 to 0.6 N·m.
  Select the appropriate cable, and crimp terminals to be used. Applicable cable sizes and crimp terminals are as follows:

Maker	Form	Types	Cable size	
			AWG	mm²
AMP	Round terminals	36467	22 to 18	0.3 to 0.8 mm²
		34104		
		34105		
Nichifu	Round terminals	0.3-3	24 to 20	0.2 to 0.5 mm²
		0.3-3N		
		1.25-3	22 to 16	0.3 to 1.3 mm²
		1.25-3N		
		1.25-3S		
		1.25-3.5N		
		1.25-3.5S		
		2-3N	16 to 14	1.3 to 2.0 mm²
	Angle edge terminals	0.3Y-3	24 to 20	0.2 to 0.5 mm²
		1.25Y-3	22 to 16	0.3 to 1.3 mm²
		1.25Y-3N		
		1.25Y-3S		
		1.25Y-3.5		
		2Y-3	16 to 14	1.3 to 2.0 mm²
		2Y-3.5S		
		AT1-10	22 to 16	0.3 to 1.3 mm²
		AT2-10	16 to 14	1.3 to 2.0 mm²
JST	Round terminals	SRA-20-3.2	22 to 18	0.3 to 0.8 mm²
		SRA-20T-3.2		
NTK	Round terminals	0.4-3	26 to 22	0.2 to 0.3 mm²
		1.25-3	22 to 16	0.3 to 1.3 mm²
	Angle edge terminals	VR1.25-3		
		VD1.25-3		
		VD2-3S	16 to 14	1.3 to 2.0 mm²



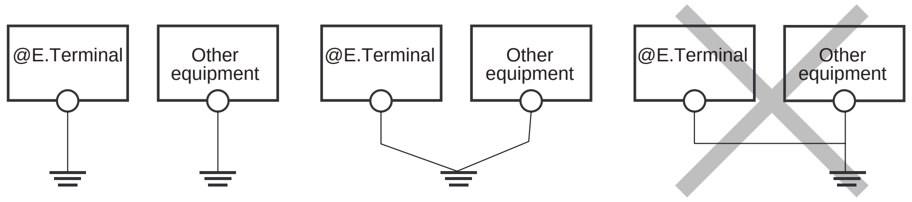
Terminal dimensions

3-2 Power Supply Cable Wiring

(2) Grounding

⚠	**Caution**	Be sure to establish a ground of the @E.Terminal. (The level of grounding resistance should be less than 100Ω.)

• An independent earth pole must be used for the @E.Terminal.
• Use a cable which has a nominal cross section of more than 2 mm^2 for grounding.
• Set the grounding point near the @E.Terminal to shorten the distance of grounding cables.



* When the @E.Terminal unit is attached to the mounting panel, the fixtures and frame grounds (FG) are connected. To detach the FG terminal from the ground, attach the insulating sheet to the fixtures and the mounting panel for insulation.

Section 4 Inspection and Maintenance

Page

Section 4 Inspection and Maintenance

4-1 Inspection and Maintenance

⚠ **Warning**	Be sure to turn off the power before conducting inspection or maintenance. Failure to do so could cause an electric shock or damage to the unit.

4-1-1 Daily inspection

- Check that the screws on the @E.Terminal are tightened firmly.
- Check that the connectors and terminal screws used for connection with other devices are tightened firmly.
- If the display surface or frame is dirty, wipe it with a soft cloth soaked in alcohol (commercially available).
- Conduct periodical inspection once or twice a year. The number of inspections may be increased as necessary if facilities are relocated or modified, or the environment is hot, humid, or dusty.

4-1-2 Periodical inspection

Inspect the following points periodically.

- Are the ambient temperature and humidity appropriate?
  0 to +50 °C, 85 % RH or less
- Are the environmental conditions appropriate?
  No excessive dust, no conductive dust contamination, and not stained with organic solvents.
- Does the atmosphere contain no corrosive gas?
- Is the source voltage in the allowable range?
  With DC power supply: 24 V DC ± 10 %
- Are the @E.Terminal mounting screws tightened firmly?
- Are the connectors and terminal screws used for connection with other devices tightened firmly?
- Is the lithium primary battery within the expiry date?
  About 5 years from the date of your purchase

4-2 Battery Replacement

When the time comes to replacement the battery, replace it for a new one even if battery error is not displayed.
Also, when low battery voltage of the display unit and the controller unit is discovered, replace the battery for a new one immediately.
Replacement the batteries of the display unit and the controller unit at the same time.

(1) Battery specification

• Controller unit

Items	Specifications
Battery specification	Lithium primary cell
Backup time	Approx. 5 years (Ambient temperature at 25 °C)
Battery boltage drop detection funnction	Provided (Status indication LED: BAT)
Battery for replacement	Type: NP8P-BT
Required time in the battery replacement	5 minutes or less

• Display unit

Items	Specifications
Battery specification	Coin-type lithium primary cell
Backup time	Approx. 5 years (Ambient temperature at 25 °C)
Battery boltage drop detection funnction	Provided (Internal memory of $s167 allocated)
Battery for replacement	Type: V7-BT
Required time in the battery replacement	3 minutes or less

(2) Precautions
- Do not short across the battery.
- Do not discard in a fire.
- Do not attempt to recharge the battery.
- Do not disassemble the battery.
- Observe local and governmental regulations when disposing of waste batteries.

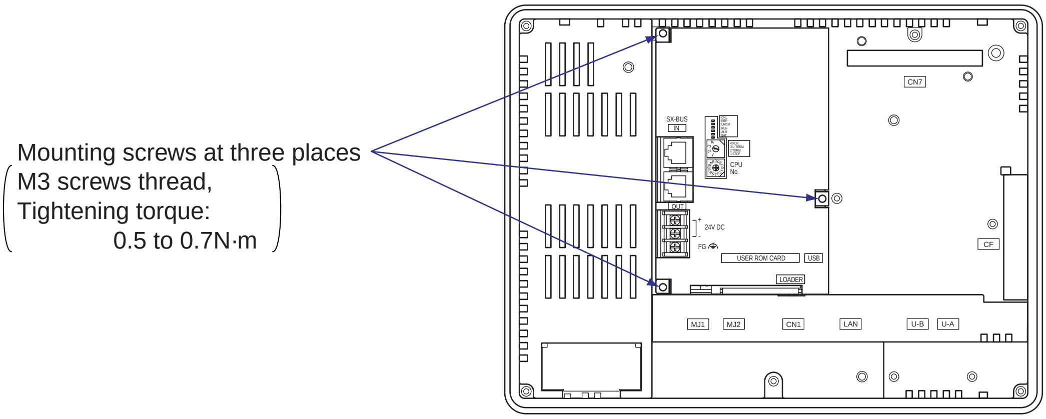
(3) How to replacement battery

• Battery replacement of controller unit

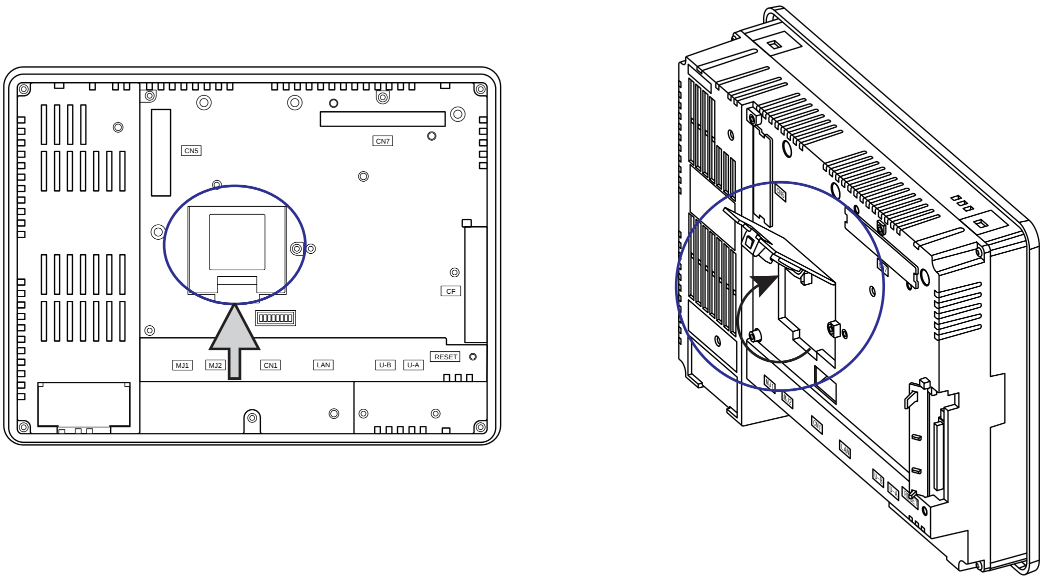
1) Turn off power supply of the @E.Terminal.
2) Remove battery holder cover at top of controller unit. Remove battery connector and then remove battery from battery holder.
3) Attach a new battery connector, mount battery into the battery holder, and attach the cover.
   Perform the exchange quickly (within five minutes). When battery is detached for a long time, the data retained during power outage may become erased.
4) Enter the battery guarantee period on a seal to be used on the occasion of the next battery replacement, and affix seal to the controller unit.

• Battery replacement of display unit

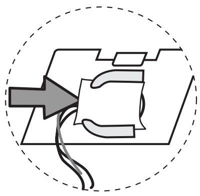
1) Remove the controller unit from @E.Terminal.
   Remove mounting screws at three places to remove the controller unit from the display unit.
   Be careful not to drop or lose the mounting screws.



2) Open the battery holder cover of the display unit in the direction of the arrow as shown in the left illustration below.



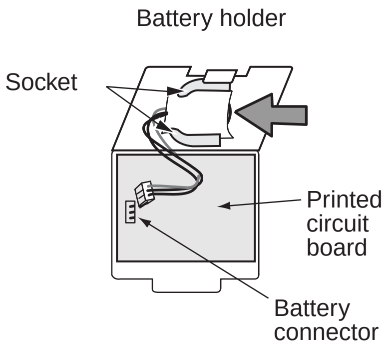
3) Remove battery connector, and slide battery to remove it from its socket, as shown in the right figure.



4) Insert a new battery into the socket so that the red cable side of the new battery faces the board and the cable is on the left side. Next, slide battery from the arrow key direction shown in the right figure.

5) Connect the battery connector, and close the battery holder cover.

6) Attach the controller unit to the display unit and fix it with mounting screws at three places.



Note: Replace the display unit battery “UG30P-BT” within three minutes after the unit is turned off. If it is not possible to replace within three minutes, make a backup copy of data in the SRAM.

4-3 Maintenance Services

4-3-1 Ordering notes

When ordering electrical and control equipment (or requesting price estimates), the following general notes are to be observed, unless otherwise specified in the estimation paper, contract paper, catalogs, or specifications.
When the product is delivered, check the contents of the package as soon as possible. Even before inspection, use caution on storing and using the product safely.

4-3-2 Free-of-charge warranty period and scope of warranty

[Free-of-charge warranty period]

(1) This product is covered by a warranty for a period of one year from the date of purchase or 18 months from the date of manufacture described in the nameplate, whichever comes earlier.
(2) This warranty period may not be applied if the operating environment, operating condition, operating frequency, or number of operations affects the operating life of the product.
(3) The warranty period for the product section repaired by Fuji Electric service sector is six (6) months from the date of completion of repair.

[Warranty period]

(1) If a failure judged to be the responsibility of Fuji Electric occurs during the warranty period, the failed section of the product is replaced or repaired on a free-of-charge basis at the site of purchase or delivery of the product. However, the following failures are not covered by this warranty.
   - Breakage of or damage to the appearance (case or surface sheet), touch switches, LCD, or other components due to dropping, impact, or mishandling
   - LCD or backlight at the end of life
   - Fusion of a printed circuit board pattern associated with connection to external devices, or fusion of a pattern in the terminal block or connector section of a printed circuit board caused by short-circuiting of external load circuit
   - Overvoltage or different voltage applied due to wiring mistake (power supply terminal, external communication terminal, or other terminal blocks)
   - Failure caused by lightning surge
   - Failure due to the entry of conductive substances, water, solvent, particles, etc. under inappropriate environmental conditions
   - Failure due to inappropriate environmental conditions (e.g. corrosive gas or high humidity)
   - Failure due to vibration or impact exceeding the specified level
   - Disassembly and modification by the customer or failure obviously resulting from improper handling by the customer

(2) The warranty is limited only to a single purchased product and a single delivered product.
(3) The upper limit of the warranty period is (1). Any damages caused by failures of the purchased product and delivered product (damages to or loss of machinery and equipment, or passive damages) are not covered by this warranty.

[Repair period after production stoppage and supply period of spare parts (maintenance period)]

As for retired models (products), Fuji Electric performs repair work within seven (7) years from the date of retirement. As for major spare parts for repair, Fuji Electric also performs repair work within seven (7) years from the date of retirement. With electronic parts, however, difficulty in procurement or production may be anticipated because of short life cycles and therefore repair or spare parts supply may be difficult even during the warranty period. For details, please contact Fuji Electric sales office or service sector.

4-3-3 Service costs

The price of the product does not include maintenance and servicing costs, such as the cost of dispatching an engineer to the customer. The customer will be charged for actual expenses in the following cases.
(1) Guidance for installation and adjustment, and attendance at a test operation
(2) Maintenance, inspection, adjustment, and repair
(3) Technical guidance and technical education

Appendix 1 About Project for @E.Terminal (No contents installed)

Page

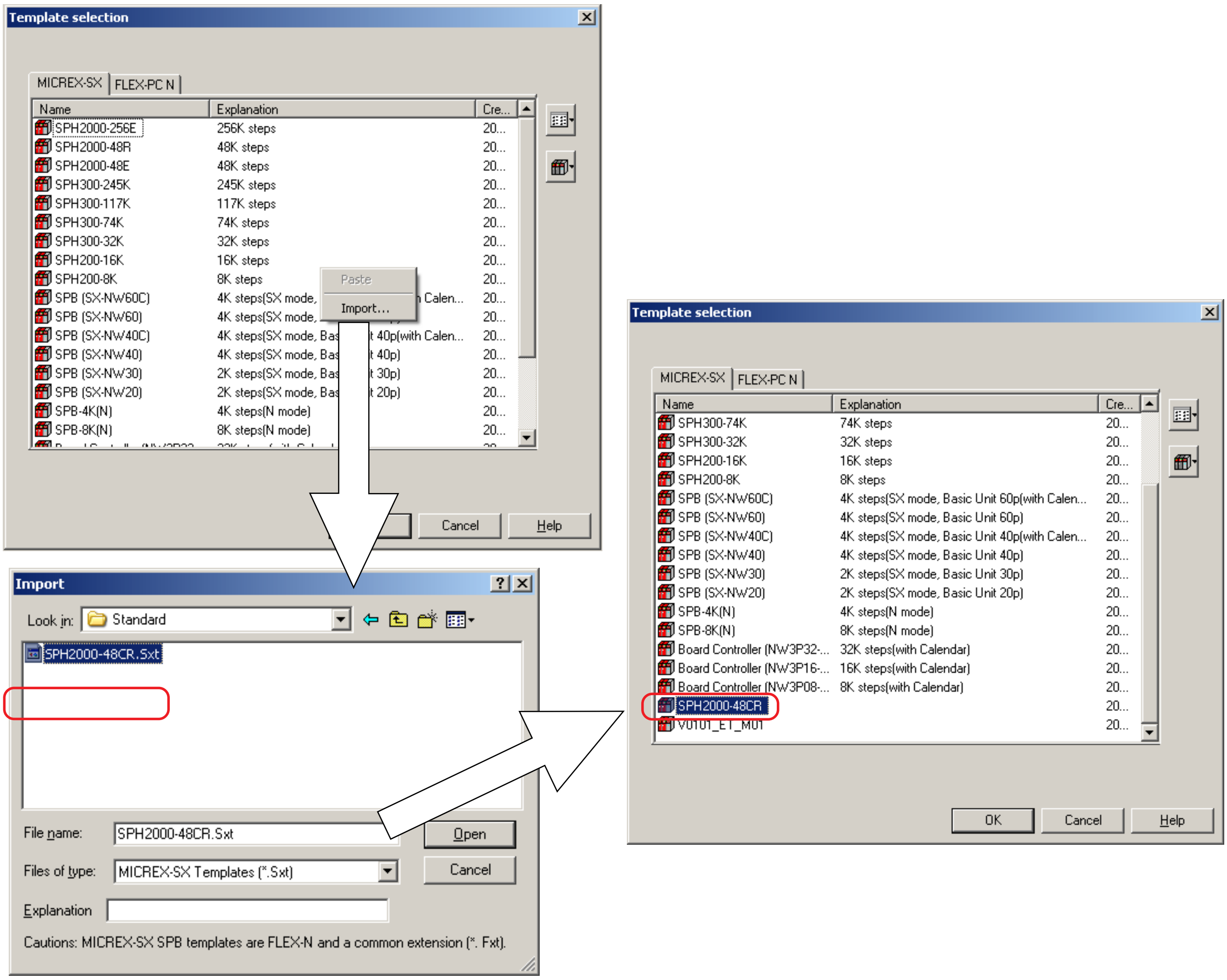
Appendix 1 About Project for @E.Terminal (No contents installed)

When you make new project for controller of @E.Terminal (No contents installed) by personal computer loader (SX-programmer Expert/ Standard), download template for new project from our homepage.
The project for controller of @E. Terminal for MC is stored in backup CD.

(1) Download template
Access to our homepage, download from [Software libraries] of [Programmable controllers].
(Address: http://www.fesys.co.jp/engl/)

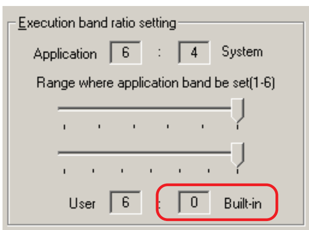
(2) Template file
• The file for SX-programmer Expert (SPH2000-48CR.zwt)
The file is compressed project type. Uncompress the project before use.
• The file for SX-programmer Standard (SPH2000-48CR.Sxt)
The file is template type. Register template in the loader before use.

(3) Order to register template to SX-Programmer Standard.
When you click [File]-[New], [Template selection] screen is displayed. Right click mouse under description area, and select [import]. Select template file at [import] dialog, and click open.



Template of <SPH2000-48CR> is registered at [Template selection] screen.

(4) Notes
In [Execution band ratio setting] of [CPU running definition], proportion of [Built-in] must be set as “0.”



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